

## Sheet1

### 1. What is an operating system?

An operating system is a program that acts as an intermediary between the user and the computer hardware. The purpose of an OS is to provide a convenient environment in which user can execute programs in a convenient and efficient manner.

### 2. What are the different operating systems?

1. Batched operating systems
2. Multi-programmed operating systems
3. timesharing operating systems
4. Distributed operating systems
5. Real-time operating systems

### 3. What are the basic functions of an operating system?

Operating system controls and coordinates the use of the hardware among the various applications programs for various uses. Operating system acts as resource allocator and manager. Also operating system is control program which controls the user programs to prevent errors and improper use of the computer. It is especially concerned with the operation and control of I/O devices.

### 4. What is kernel?

part of computer operating system that provides basic services for all parts of OS.

5.

### What is dead lock?

Deadlock is a situation or condition where the two processes are waiting for each other to complete so that they can start. This result both the processes to hang.

### 6 . What is a process?

A program in execution is called a process. Processes are of two types:

1. Operating system processes
2. User processes

### 7. What are the states of a process?

1. New
2. Running
3. Waiting
4. Ready
5. Terminated

### 8 . What is starvation and aging?

Starvation is Resource management problem where a process does not get the resources it needs for a long time because the resources are being allocated to other processes.

Aging is a technique to avoid starvation in a scheduling system.

### 9 . What is semaphore?

Semaphore is a variable, whose status reports common resource, Semaphore is of two types one is Binary semaphore and other is Counting semaphore.

### 10 What is a thread?

A thread is a program under execution. Thread sometimes is a basic unit of CPU utilization; it comprises a thread id, a program counter, a register set, and a stack

**11. What is process synchronization?**

A situation, where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, is called race condition. To guard against the race condition we need to ensure that only one process at a time can be manipulating the same data. The technique we use for this is called process synchronization.

**12. What is virtual memory?**

Virtual memory is hardware technique where the system appears to have more memory than it actually does. This is done by time-sharing, the physical memory and storage parts of the memory on disk when they are not actively being used.

**13. What is thrashing?**

It is a phenomenon in virtual memory schemes when the processor spends most of its time swapping pages, rather than executing instructions. This is due to an inordinate number of page faults.

**14. What is fragmentation? What different types of fragmentation?**

When many of free blocks are too small to satisfy any request then fragmentation occurs. External fragmentation and internal fragmentation are two types of fragmentation. External Fragmentation happens when a dynamic memory allocation algorithm allocates some memory and a small piece is left over that cannot be effectively used. Internal fragmentation is the space wasted inside of allocated memory blocks because of restriction on the allowed sizes of allocated blocks.